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The valuation of swelling rate of clayey rock

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Abstract

Theoretical basis for constructing models of swelling argillaceous rocks, including oil reservoirs, is the following representation of the thermodynamics of emerging clay osmotic pressure created by ions-compensators negative electric charge of clay particles. This charge is caused by heterovalent substitution of iron ions in the octahedral sites and silicon ions in tetrahedral sites. In equilibrium, the osmotic pressure is balanced by the external loadding pressure of the outer system. In the case when the system is not in equilibrium, we can assume that the rate of relaxation of the system to equilibrium is proportional to the difference between the inducement (osmotic pressure) and deterrent (external load) swelling factor.

Keywords

Compression experiments, Deformations, Swelling, Total load